

# 1.2

## Useful Statistics

### At a Glance

PACING 1½ days

#### Mathematical Goals

- Use mode, median, how data vary from the least to the greatest values, and range to describe what is typical about a data distribution
- Use tables and line plots to display data distributions

#### Launch

You can begin by asking students what the word median means to them.

- *When you hear the word “median,” what do you think of?*
- *In this problem you will find out what the median and the mode mean in a mathematical sense. You will also learn about range and spread.*

Review both the mode and range using Ms. Jee’s data.

Have students refer to the data for Problem 1.2, or display Transparencies 1.2A and 1.2B.

- *We want to find the median, or middle value, for these data. The median separates the data so that the same number of data values are before this value and after this value. To find the median, we must first order the data from least to greatest.*

Write each name length on a large stick-on note, and display the lengths in the order they occur in the table. Have students work in pairs.

#### Materials

- Transparencies 1.2A, 1.2B
- Stick-on notes
- Centimeter grid paper
- Graph paper
- Scissors

#### Vocabulary

- mode
- range
- median
- spread

#### Explore

After ordering the data as a class, have students work on Questions A and B. Then go to Question C. The line plot raises the issue of what effect a missing value has on the median. For Question D, if students have trouble, read aloud the description of the hypothetical class.

- *What facts do we know about this class of students?*
- *How can we use these facts to find a set of name lengths?*
- *Is there more than one possible set of name lengths fitting the description? Why? Why not?*

Display the students’ line plots.

#### Summarize

For Questions A and B, create one strip for the original 21 values and the other for the 22 values, and mark the median. Hold up the strip with 21 values.

- *For the 21 values, the fold occurred on a 12. The same number of values are before the fold and after the fold. The median name length is 12 letters.*

#### Materials

- Student notebooks

continued on next page

## Summarize

continued

Hold up the strip of 22 values.

- For the strip of 22 values, the fold occurred between 12 and 13. With an even number of values, the median is the number halfway between the two middle values. In this case, the median name length is  $12\frac{1}{2}$ .

Direct students to look at the table and graph of the original data.

- Where is the median name length of 12 letters located on the line plot?
- How does the median compare to the mode in this data set?
- After adding Suzanne Mannerstrale's name, how does the median compare to the mode?
- Can the median have the same value as the mode?
- If we had many data values, folding a strip of paper to find the median would be inefficient. Can you think of another way to find the median?
- Now look at Question C. What is the median?

For Question D, the goal is not for students to determine all possible answers, but to realize that many solutions are possible. Have students display their line plots.

- How are the different line plots alike? Different? Why?

## ACE Assignment Guide for Problem 1.2



Core 2, 5–12

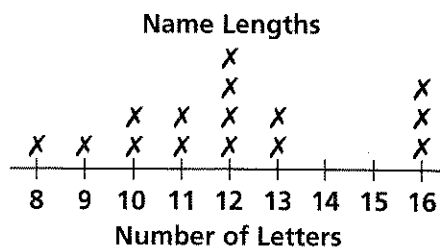
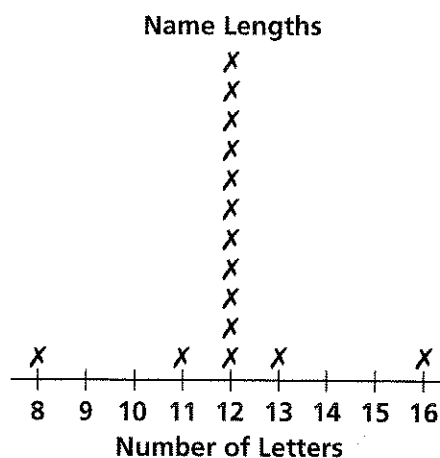
Other Applications 3, 4; Connections 26–28; unassigned choices from previous problems

Adapted For suggestions about adapting Exercises 3–6 and other ACE exercises, see the CMP Special Needs Handbook.

## Answers to Problem 1.2

- A. 1. The crease occurs on 12.  
2. There are 10 values to the left of the crease.  
3. There are 10 values to the right of the crease.  
4. The median is 12 letters.
- B. 1. The crease occurs between 12 and 13.  
2. There are 11 values to the left of the crease.  
3. There are 11 values to the right of the crease.  
4. The median is  $12\frac{1}{2}$  letters.
- C. The median is 10 letters. The mode is 9.
- D. 1. Answers will vary. A correct answer will have a set of 15 names with lengths varying from 8 to 16 letters, with the value 12 occurring most frequently.

### 2. Possible line plots:



3. Answers will vary. Students may discuss mode and range or the intervals in which the data cluster.